

We claim:

1. An array of radiating elements comprising:

a first plurality of antenna elements in an array configuration, said first plurality of antenna elements configured for operating on a first band of frequencies; and

a second plurality of antenna elements in an array configuration, said second plurality of antenna elements configured for operating on a second band of frequencies;

wherein said first plurality of antenna elements are positioned below said second plurality of antenna elements, said first plurality of antenna elements acting as an effective ground plane for said second plurality of antenna elements.

2. The array according to claim 1, further comprising a dielectric material interposed between said first plurality of antenna elements and said second plurality of antenna elements.

3. The array according to claim 1 wherein said array is configured for wideband operation by having said first band of frequencies adjacent to said second band of frequencies.

1 4. The array according to claim 1 wherein said first plurality of antenna elements  
2 are aligned in a first planar grid pattern of spaced rows and columns and said  
3 second plurality of antenna elements are aligned in a second planar grid pattern of  
4 spaced rows and columns, said second grid pattern rotated at an angle relative to  
5 said first grid pattern.

6 5. The array according to claim 4 wherein said angle is approximately 45 degrees.

7 6. The array according to claim 4 further comprising a set of first feed organizers  
8 for communicating RF signals to said first plurality of antenna elements and a set of  
9 second feed organizers for communicating RF signals to said second plurality of  
10 antenna elements, said first and second feed organizers arranged in a common grid  
11 pattern and extending upward toward said first and second plurality of antenna  
12 elements and wherein a plurality of RF feeds of said second feed organizers form a  
13 second feed organizer grid pattern interposed on said common grid pattern.

14 7. The array according to claim 6 wherein said RF feeds of said second feed  
15 organizers extend through a plane approximately defined by said first plurality of  
16 antenna elements to communicate RF to said second plurality of antenna elements.

1 8. The array according to claim 1, further comprising a ground plane positioned  
2 below said first plurality of antenna elements, and a dielectric layer interposed  
3 between said ground plane and said first plurality of antenna elements.

1 9. The array according to claim 1 wherein said first and second plurality of  
2 antenna elements are planar antenna elements.

1 10. The array according to claim 9 wherein at least one of said first and second  
2 plurality of antenna elements comprise:

3 an elongated body portion; and

4 an enlarged width end portion connected to an end of the elongated body  
5 portion.

1 11. The array according to claim 10 wherein said enlarged width end portions of  
2 adjacent ones of said antenna elements comprise interdigitated portions.

1 12. The array according to claim 1 wherein at least one of said first and second  
2 plurality of antenna elements comprise adjacent dipole antenna elements, wherein  
3 at least one end portion of each dipole element is capacitively coupled to a  
4 corresponding end portion of an adjacent dipole element.

1 13. An array of radiating elements comprising:

2 a first plurality of antenna elements aligned in a first grid pattern of spaced  
3 rows and columns, said first plurality of antenna elements configured for operating  
4 on a first band of frequencies;

5 a second plurality of antenna elements aligned in a second grid pattern of  
6 spaced rows and columns and positioned above said first plurality of antenna  
7 elements, said second plurality of antenna elements configured for operating on a  
8 second band of frequencies and said second grid pattern rotated at an angle  
9 relative to said first grid pattern;

10 said first plurality of antenna elements acting as an effective ground plane  
11 for said second plurality of antenna elements; and,

12 a set of first feed organizers for communicating RF signals to said first  
13 plurality of antenna elements and a set of second feed organizers for  
14 communicating RF signals to said second plurality of antenna elements, said first  
15 and second feed organizers arranged in a common grid pattern and extending  
16 upward toward said first and second plurality of antenna elements and wherein a  
17 plurality of RF feeds of said second feed organizers form a second feed organizer  
18 grid pattern interposed on said common grid pattern.

- 1 14. The array according to claim 13, further comprising a dielectric material  
2 interposed between said first plurality of antenna elements and said second  
3 plurality of antenna elements.
- 1 15. The array according to claim 13 wherein said first and second plurality of  
2 antenna elements are planar antenna elements.
- 1 16. The array according to claim 15 wherein at least one of said first and second  
2 plurality of antenna elements comprise:  
3 an elongated body portion; and  
4 an enlarged width end portion connected to an end of the elongated body  
5 portion.
- 1 17. The array according to claim 16 wherein said enlarged width end portions of  
2 adjacent ones of said antenna elements comprise interdigitated portions.
- 1 18. The array according to claim 13 wherein said angle is approximately 45  
2 degrees.
- 1 19. An array of radiating elements comprising:

2 a first plurality of planar antenna elements comprising elongated first body  
3 portions and enlarged width first end portions connected to correlating ends of the  
4 first body portions, said first plurality of antenna elements disposed in an array  
5 configuration for operating on a first band of frequencies, and the first end portions  
6 of adjacent ones of the first antenna elements comprising interdigitated portions;

7 a second plurality of planar antenna elements comprising elongated second  
8 body portions and enlarged width second end portions connected to correlating  
9 ends of the second body portions, said second plurality of antenna elements  
10 disposed in an array configuration for operating on a second band of frequencies,  
11 and the second end portions of adjacent ones of the second antenna elements  
12 comprising interdigitated portions; and,

13 said first plurality of antenna elements being positioned below said second  
14 plurality of antenna elements, said first plurality of antenna elements acting as an  
15 effective ground plane for said second plurality of antenna elements.

1 20. The array according to claim 19, further comprising a dielectric material  
2 interposed between said first plurality of antenna elements and said second  
3 plurality of antenna elements.

1 21. The array according to claim 19, wherein said first plurality of antenna  
2 elements are aligned in a first grid pattern of spaced rows and columns and said

3 second plurality of antenna elements are aligned in a second grid pattern of spaced  
4 rows and columns, said second grid pattern rotated at an angle relative to said first  
5 grid pattern.

1 22. The array according to claim 21, wherein said angle is approximately 45  
2 degrees.

3 23. The array according to claim 21 further comprising a set of first feed  
4 organizers for communicating RF signals to said first plurality of antenna elements  
5 and a set of second feed organizers for communicating RF signals to said second  
6 plurality of antenna elements, said first and second feed organizers arranged in a  
7 common grid pattern and extending upward toward said first and second plurality  
8 of antenna elements and wherein a plurality of RF feeds of said second feed  
organizers form a second grid feed organizer pattern interposed on said common  
grid pattern.